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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,520	10/24/2001	Mike Lohman	PD-201011	8872
29158	7590	02/23/2006	EXAMINER	
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CHICAGO, IL 60690-1135			ART UNIT	PAPER NUMBER
			2662	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/039,520	LOHMAN ET AL.
	Examiner Mohammad S. Adhami	Art Unit 2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 06 December 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-32 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 06 December 2005 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

DETAILED ACTION

- Applicant's Amendment filed 12/06/2005 is acknowledged.
- Claims 1-16,18,20-22,24-27,29-31 have been amended.
- Claims 32-35 have been cancelled.
- Applicant's response and amendment with respect to the first action objection of the drawings and specifications is noted and the objections are withdrawn.
- Claims 1-32 are pending

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over George (US 5,214,789) in view of Pulkkinen (US App.2001/0014083).

Re claim 1:

George discloses at least one first terminal configured to transmit a signal (Col. 1 lines 23-24 "a mobile station radio in a vehicle transmits a request") and a second terminal to receive the signal and support a plurality of channels (Col. 1 lines 25-27 "access to any one of a plurality of communication channels available at the station...if the requested station hears the request from the mobile radio").

George does not explicitly disclose a *terminal configured to function as a remote and a hub terminal*.

Pulkkinen discloses a *terminal configured to function as a remote and a hub terminal* (Fig.3 where reference BTS 4 functions as a remote terminal to reference 31 and as a hub terminal to reference “MS”).

George and Pulkkinen are analogous because they both pertain to communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify George to have terminals configured to function as a remote and a hub terminal as taught by Pulkkinen in order to extend the range of the network by utilizing the existing network infrastructure.

Re claim 3:

George has a second terminal configured to repeat the received signal (Col. 1 line 23 “repeater stations” where “station” refers to the second terminal as discussed above.)

1. Claims 1,2,8-12,14,15,20-28,30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kay (US 6,836,515) in view of Pulkkinen.

Re claims 1 and 2:

[Claims 1 and 2] Kay has a first terminal configured to transmit a signal and a second terminal configured to receive the signal (Col. 9 lines 6-7 “This enables the hub terminal...to transmit to all of the remote terminals”) and support a plurality of channels (Col. 12 lines 37-40 “A wide variety of channel bandwidths

could be selected and divided into a wide variety of subchannels using various symbols rates"), and [Claim 2] outdoor units configured to operate in at least a first mode to support load sharing and a second mode to perform testing (Col. 75 lines 18-19 "One testing technique known is called "load sharing" and Col. 75 lines 29-30 and 32-33 "Another backup testing technique is to switch to the backup hub terminal...once a day...the backup hub terminal...simply transmits a test burst" where a hub terminal contains an outdoor unit Col. 34 lines 14-15 "hub terminals...each having a main outdoor unit (ODU)").

Kay suggests, but does not explicitly disclose a *terminal configured to function as a remote and a hub terminal*.

Pulkkinen discloses a *terminal configured to function as a remote and a hub terminal* (Fig.3 where reference BTS 4 functions as a remote terminal to reference 31 and as a hub terminal to reference "MS").

Kay and Pulkkinen are analogous because they both pertain to communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to have terminals configured to function as a remote and a hub terminal as taught by Pulkkinen in order to extend the range of the network by utilizing the existing network infrastructure.

Re claim 8:

Kay has a plurality of outdoor units configured to support a plurality of channels (Col. 12 lines 37-40 "A wide variety of channel bandwidths could be

selected and divided into a wide variety of subchannels using various symbols rates"), an indoor unit coupled to outdoor units (Col. 23 lines 45-47 "The outdoor unit...communicates with the indoor unit...via the intrafacility link"), and an indoor unit receiving signals from a hub over a wireless link (Col. 9 lines 6-7 "This enables the hub terminal...to transmit to all of the remote terminals").

Kay suggests, but does not explicitly disclose a *terminal configured to function as a remote and a hub terminal*.

Pulkkinen discloses a *terminal configured to function as a remote and a hub terminal* (Fig.3 where reference BTS 4 functions as a remote terminal to reference 31 and as a hub terminal to reference "MS").

. Kay and Pulkkinen are analogous because they both pertain to communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to have terminals configured to function as a remote and a hub terminal as taught by Pulkkinen in order to extend the range of the network by utilizing the existing network infrastructure.

Re claim 9:

Kay has an indoor unit with a transceiver (Col. 23 lines 35-40 "The indoor unit...[contains] a channel and control module...[which] includes: am IF-transceiver section"), and a switching engine (Col. 11 lines 7-10 "Each indoor unit...(channel processing unit) of the remote terminal...has four SSI ports to

allow for several different subscriber interfaces or service specific interface modules and Figure 9 reference 914).

Re claim 10:

Kay has a switching engine with an ATM, IP, Ethernet, and VLAN switch (Col. 57 lines 2-9 "Thus the multi-transport mode SSI module...is provided for subscribers who require both TDM and ATM services...It has eight T1/E1 interfaces...4 LAN controllers...but could be altered in manufacturing cased upon specific needs").

Re claim 11:

Kay has an outdoor unit with a plurality of antennas that are at least narrow beam or sectorized (Col. 35 lines 2-5 "the outdoor unit...may include a switched beam antenna...such that a switch is coupled to several antennas" and Col. 15 lines 14-15 "The antenna would have a very narrow beamwidth" and Col. 8 line 31 "which may be sectored antennas").

Re claim 12:

Kay has outdoor units configured to operate in at least a first mode to support load sharing and a second mode to perform testing (Col. 75 lines 18-19 "One testing technique known is called "load sharing" and Col. 75 lines 29-30 and 32-33 "Another backup testing technique is to switch to the backup hub terminal...once a day...the backup hub terminal...simply transmits a test burst" where a hub terminal contains an outdoor unit Col. 34 lines 14-15 "hub terminals...each having a main outdoor unit (ODU)").

Re claim 14:

Kay has a modem within at least one of the indoor unit and each of the outdoor units (Fig. 9 and Col. 24 lines 32-33 "while the digital baseband section...contains the multi-modulation modem").

Re claim 15:

Kay has fiber optic cables coupling the outdoor units and the indoor units (Col. 23 lines 45-47 "The outdoor unit...communicates with the indoor unit...via the intrafacility link").

Re claim 20:

Kay discloses a hub node transmitting radio signals with a first modulation scheme (Col. 9 lines 4-6 "a single hub terminal...may transmit one burst using one modulation mode"), a plurality of relay nodes configured to receive signals from the hub node (Figure 1 where RT is the "relay node") and forwarding signals according to a second modulation scheme (Col. 9 lines 7-10 "This enables the hub terminal...to transmit to all of the remote terminals...regardless of what modulation mode is employed by each of the remote terminals." It is implicit in this statement that because the hub terminal modulation mode can transmit regardless of the modulation mode of the remote terminal, that the remote terminal can have a different ("second") modulation mode.).

Kay suggests, but does not explicitly disclose *forwarding signals from a "relay node" to a "radio terminal" and a terminal configured to function as a remote and a hub terminal.*

Pulkkinen discloses *forwarding signals from a “relay node” to a “radio terminal” and a terminal configured to function as a remote and a hub terminal* (Fig.3 where reference BTS 5 serves as a “relay node” and forwards signals to the “radio terminals” BTS 6-8 where reference BTS 4 shows the “radio terminal” functioning as a remote terminal to reference 31 and as a hub terminal to reference “MS”).

Kay and Pulkkinen are analogous because they both pertain to communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to include a relay node and to have terminals configured to function as a remote and a hub terminal as taught by Pulkkinen in order to extend the range of wireless communications by utilizing the existing network infrastructure.

Re claim 21:

Kay has a relay node that is a plurality of terminals (Figure 1 where RT stands for “remote terminal”).

Re claim 22:

Kay has terminals that provide transmission over a plurality of channels (Col. 12 lines 37-40 “A wide variety of channel bandwidths could be selected and divided into a wide variety of subchannels using various symbols rates”).

Re claim 23:

Kay has a modulation scheme that is at least QPSK or QAM and dual polarization QPSK (Col. 9 lines 44-47,49,50 "the hub terminals...and remote terminals...can modulate and demodulate these signals using multiple modulation modes, such as quadrature phase shift keying (QPSK), 16-quadrature amplitude modulation (16-QAM)...The system is not limited to these modulations").

Re claim 24:

Kay has a transmission means (Col. 12 line 1 "the outdoor unit...(ODU) (or transceiver unit)") supporting a plurality of channels (Col. 12 lines 37-40 "A wide variety of channel bandwidths could be selected and divided into a wide variety of subchannels using various symbols rates"), and an indoor unit coupled to the transmission means (Col. 12 lines 3-5 "The outdoor unit...of the remote terminal...communicates with the indoor unit") that receives signals from a hub terminal (Col. 9 lines 6-7 "This enables the hub terminal...to transmit to all of the remote terminals").

Kay suggests, but does not explicitly disclose a *terminal configured to function as a remote and a hub terminal*.

Pulkkinen discloses a *terminal configured to function as a remote and a hub terminal* (Fig.3 where reference BTS 4 functions as a remote terminal to reference 31 and as a hub terminal to reference "MS").

Kay and Pulkkinen are analogous because they both pertain to communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to have terminals configured to function as a remote and a hub terminal as taught by Pulkkinen in order to extend the range of the network by utilizing the existing network infrastructure.

Re claim 25:

Kay has an indoor unit with a transceiver (Col. 23 lines 35-40 "The indoor unit...[contains] a channel and control module...[which] includes: an IF-transceiver section") and a switching engine (Col. 11 lines 7-10 "Each indoor unit...(channel processing unit) of the remote terminal...has four SSI ports to allow for several different subscriber interfaces or service specific interface modules and Figure 9 reference 914).

Re claim 26:

Kay has a switching engine with an ATM, IP, Ethernet, and VLAN switch (Col. 57 lines 2-9 "Thus the multi-transport mode SSI module...is provided for subscribers who require both TDM and ATM services...It has eight T1/E1 interfaces...4 LAN controllers...but could be altered in manufacturing based upon specific needs").

Re claim 27:

Kay has a transmission means with a plurality of antennas that are at least narrow beam or sectorized (Col. 35 lines 2-5 "the outdoor unit...may include a

switched beam antenna...such that a switch is coupled to several antennas" and Col. 15 lines 14-15 "The antenna would have a very narrow beamwidth" and Col. 8 line 31 "which may be sectored antennas").

Re claim 28:

Kay has outdoor units configured to operate in at least a first mode to support load sharing and a second mode to perform testing (Col. 75 lines 18-19 "One testing technique known is called "load sharing" and Col. 75 lines 29-30 and 32-33 "Another backup testing technique is to switch to the backup hub terminal...once a day...the backup hub terminal...simply transmits a test burst" where a hub terminal contains an outdoor unit Col. 34 lines 14-15 "hub terminals...each having a main outdoor unit (ODU)").

Re claim 30:

Kay has a modem within at least one of the indoor unit and each of the outdoor units (Fig. 9 and Col. 24 lines 32-33 "while the digital baseband section...contains the multi-modulation modem").

Re claim 31:

Kay has fiber optic cables coupling the outdoor units and the indoor units (Col. 23 lines 45-47 "The outdoor unit...communicates with the indoor unit...via the intrafacility link"). Official notice is taken that the intrafacility link could be a fiber optic link.

2. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kay in view of Pulkkinen as applied to claim 1 above, and further in view of Britz (2004/0202474).

Re claim 4:

Kay discloses a switching engine (Col. 11 lines 7-10 "Each indoor unit... (channel processing unit) of the remote terminal... has four SSI ports to allow for several different subscriber interfaces or service specific interface modules and Figure 9 reference 914), a transceiver (Col. 23 lines 35-40 "The indoor unit... [contains] a channel and control module... [which] includes: an IF-transceiver section"), and an outdoor unit with a plurality of antennas, where the antennas are narrow beam or sectorized (Col. 35 lines 2-5 "the outdoor unit... may include a switched beam antenna... such that a switch is coupled to several antennas" and Col. 15 lines 14-15 "The antenna would have a very narrow beamwidth" and Col. 8 line 31 "which may be sectored antennas").

Kay does not explicitly disclose a plurality of outdoor units coupled to the indoor unit.

Britz discloses a plurality of outdoor units coupled to the indoor unit (Paragraph [0021] "Each node includes at least one outdoor unit... (hereinafter ODU), and typically a plurality of ODUs... Each ODU is coupled to switch circuit... Typically switch circuit... [is] part of an indoor unit").

Kay and Britz are analogous because they both pertain to wireless communications involving indoor and outdoor units.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to include a plurality of outdoor units coupled to an indoor unit as taught by Britz in order to support a greater number of users through efficient use of the system equipment.

Re claim 5:

Kay has a digital modem within at least one of the indoor units and each of the outdoor units (Fig. 9 and Col. 24 lines 32-33 "while the digital baseband section...contains the multi-modulation modem").

Re claim 6:

Kay has fiber optic cables coupling the outdoor units and the indoor units (Col. 23 lines 45-47 "The outdoor unit...communicates with the indoor unit...via the intrafacility link"). Official notice is taken that the intrafacility link could be a fiber optic link.

Re claim 7:

Kay has a switching engine with an ATM, IP, Ethernet, and VLAN switch (Col. 57 lines 2-9 "Thus the multi-transport mode SSI module...is provided for subscribers who require both TDM and ATM services...It has eight T1/E1 interfaces...4 LAN controllers...but could be altered in manufacturing cased upon specific needs").

3. Claims 16-19, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kay in view of Pulkkinen and further in view of George.

Re claim 16:

Kay discloses receiving a signal (Col. 9 lines 6-7 "This enables the hub terminal...to transmit to all of the remote terminals") over a communication channel among a plurality of channels (Col. 12 lines 37-40 "A wide variety of channel bandwidths could be selected and divided into a wide variety of subchannels using various symbols rates").

Kay does not explicitly disclose selectively repeating a signal to another terminal.

George discloses selectively repeating a signal to another terminal (Abstract "A broadcast two-way radio communication system has a plurality of transmit/receive stations which function as repeaters." and Col. 1 line 23 "repeater stations where "station" refers to an indoor unit) in a wireless communication system.

Kay and George are analogous because they both have transmit/receive stations in wireless communication system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to include selectively repeating a signal as taught by George in order to extend the range of the wireless communications system.

Kay suggests, but does not explicitly disclose a *terminal configured to function as a remote and a hub terminal*.

Pulkkinen discloses a *terminal configured to function as a remote and a hub terminal* (Fig.3 where reference BTS 4 functions as a remote terminal to reference 31 and as a hub terminal to reference "MS").

Kay and Pulkkinen are analogous because they both pertain to communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to have terminals configured to function as a remote and a hub terminal as taught by Pulkkinen in order to extend the range of the network by utilizing the existing network infrastructure.

Re claim 17:

Kay has outdoor units configured to operate in at least a first mode to support load sharing and a second mode to perform testing (Col. 75 lines 18-19 "One testing technique known is called "load sharing" and Col. 75 lines 29-30 and 32-33 "Another backup testing technique is to switch to the backup hub terminal...once a day...the backup hub terminal...simply transmits a test burst" where a hub terminal contains an outdoor unit Col. 34 lines 14-15 "hub terminals...each having a main outdoor unit (ODU)").

Re claim 18:

Kay has a switching engine with an ATM, IP, Ethernet, and VLAN switch (Col. 57 lines 2-9 "Thus the multi-transport mode SSI module...is provided for subscribers who require both TDM and ATM services...It has eight T1/E1

interfaces...4 LAN controllers...but could be altered in manufacturing cased upon specific needs").

Re claim 19:

Kay has method that demodulates the received signal including at least the modulation schemes of QPSK and QAM (Col. 9 lines 44-47,49,50 "the hub terminals...and remote terminals...can modulate and demodulate these signals using multiple modulation modes, such as quadrature phase shift keying (QPSK), 16-quadrature amplitude modulation (16-QAM)...The system is not limited to these modulations").

Re claim 29:

As discussed above in view of claim 24, Kay meets all the limitations of the parent claim. Kay discloses a "transmission means" (Col. 12 line 1 "the outdoor unit...(ODU) (or transceiver unit)") supporting a plurality of channels (Col. 12 lines 37-40 "A wide variety of channel bandwidths could be selected and divided into a wide of subchannels using various symbols rates"). The ODU is referred to as a transceiver, thus implying it can transmit signals over the stated plurality of channels.

Kay does not explicitly disclose selectively repeating a signal via a "transmission means."

George discloses an "indoor unit" that repeats a received signal (Abstract "A broadcast two-way radio communication system has a plurality of transmit/receive stations which function as repeaters." and Col. 1 line 23

"repeater stations where "station" refers to an indoor unit) in a wireless communication system.

Kay and George are analogous because they both have transmit/receive stations in wireless communication system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay in view of Britz to include repeating a received signal as taught by George in order to extend the range of the wireless communications system.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kay in view of Pulkkinen as applied to claim 8 above, and further in view of George.

Re claim 13:

As discussed above, Kay meets all the limitations of the parent claims.

Kay does not explicitly disclose an indoor unit to repeat the received signal.

George discloses an "indoor unit" that repeats a received signal (Abstract "A broadcast two-way radio communication system has a plurality of transmit/receive stations which function as repeaters." and Col. 1 line 23 "repeater stations where "station" refers to an indoor unit) in a wireless communication system.

Kay is analogous to George because they all deal with wireless communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kay to include repeating a received signal as taught by George in order to extend the range of the wireless communications system by utilizing the existing network infrastructure.

Response to Arguments

5. Applicant's arguments with respect to claims 1,8,16,20, and 24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad S. Adhami whose telephone number is (571)272-8615. The examiner can normally be reached on Monday-Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571)272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MSA 2/15/2006



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